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EXAMINER	
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2872	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/817,592	HARTKOP ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52 and 57-81* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-52 and 57-81* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **September 22, 2006** has been entered.

2. This Office Action is also in response to applicant's amendment filed on September 22, 2006.

3. By this amendment, the applicant has amended claims 11, 21, 42, 57, 68, and 76.

4. Claims 1-52 and 57-81 remain pending in this application.

Response to Amendment

5. The amendment filed **April 3, 2006** is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: **claims 1, 21, 27, 29, 42, and 57 have been amended** to include the phrase "a displayed 3D image". The specification simply fails to disclose a 3D image can be displayed on a display screen since it is impossible.

The amendment filed **September 22, 2006** is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: **claims 21, 42, 57, and 68 have been amended** to include the phrase "a displayed 3D image are simultaneously viable" or the phrase "which are simultaneously viewable". The specification simply fails to disclose such **simultaneously** viewing explicitly. An observer has only two

eyes that can "simultaneously" placed at two locations to view two different perspectives however the same observer cannot simultaneously view more than two perspectives located different spatial locations.

Applicant is required to cancel the new matter in the reply to this Office Action.

The applicant is respectfully noted there is no such thing as 3D image by itself. Every image is 2D in nature; it is the optical illusion that makes the 2D image displayed to be viewed with 3D effect.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 1-52, and 57-67 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reasons for rejections based on the newly added matters are set forth in the paragraph above.

8. **Claims 1-52 and 57-81 are rejected under 35 U.S.C. 112, first paragraph,** as **failing** to comply with the **enablement** requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification and the claims **fails** to teach how could a three-dimensional display device and method for manufacturing solid state three dimensional device be achieved by simply having a display

screen and an aperture plate. Three-dimensional display of image simply **cannot** be created by such arrangement *only*. Three dimensional display is achieved by **firstly** having stereo-related image displayed on the display screen and then with *certain optics* to ensure the left eye perspective of the image goes to the left eye and the right eye perspective of the image goes to right eye of an observer respectively. The claims simply **fail** to disclose such. The three dimensional display simply will **NOT** provide "multiple different perspectives viewable from multiple different user viewing angles" as recited in the claims and simply will **NOT** be able to "exhibit both horizontal and vertical parallax" as recited in the claims. Certain essential elements and conditions are needed to achieve such features that are not in the claims to make the claims enabling.

Claims 1, 21, 27, 29, 42, and 57 have been amended to include the phrase "multiple different perspectives of a displayed 3D image". The specification fails to teach how could a 3D image being displayed by a 2D display device. There simply is no such thing as 3D image that can be displayed on a 2D display device. 3D image is really an **illusion** to eyes generated by either the combination of the specifically arranged images (i.e. stereo-related images) and optical arrangement or holographically recording 3D object as a hologram and replay the hologram. However none of such has been explicitly stated in the claims. The claims therefore are not enabling. The applicant is respectfully noted having images of different perspectives of an 3D **object** does not necessary provides a displayed 3D image. Certain optical arrangement corresponding to the different perspectives of the images are needed to cooperate with the perspective images to provide 3D images. Furthermore, the applicant being one skilled in the art must know that the left-eye stereo image and right-eye stereo image are different image perspectives of an object viewing from different viewing angles.

Applicant's arguments which concerning the rejections under 35 USC 112, first paragraph, based on the technical merit of "around the moving aperture" are not persuasive since firstly, this is different from applicant's previous arguments which stated that the 3D image display device of

the present invention is "holographic" in nature and not stereoscopic as stated in the Remark submitted on April 3, 2006. It is really confusing now since it is not clear if the 3D image display is based on what technique merit? Secondly, if the merit is based on "moving aperture" then none of the claims (close to 80 of them) ever claim such feature. The arguments which based on a feature that is not in the claims therefore cannot be relied upon to overcome the rejection.

Applicant's arguments concerning the phrase "the transmission of left and right eye data at different angle is the basis for holography. While the data actually displayed on the display surface of the present invention is not a hologram, the effect is holographic in nature" which recited in Remark (page 24 second paragraph), are not making any sense. Firstly, it is not clear what does it mean by "transmission of the left and right eye data at different angles", it is not clear if the transmission means the transmission of the left eye and right eye data WITH REGARD TO THE APERTURE at different angle. If so, this is based on the nature of simple geometry. Transmission of the image data at different angle is not a basis for holography. Holography is based on interference of coherent light. There is no such criterion or arrangement for such effect to occur. Secondly, it is not clear what is considered to be the "effect is in holographic nature". Again holography is based on interference of coherent light beams, there is simply no such arrangement present to allow any interference to occur so it is not clear what feature or effect is "holographic in nature".

The applicant is also respectfully noted that the different viewer perspectives are not provided by the aperture, but are provided by having different image elements that representing different perspectives. The aperture, based on the geometry, will direct different image element displayed on the display device, at different spatial location, to different viewing positions. However if the image elements are all of the same image perspective, then different viewer at different observation will see basically the same image. A plane image when viewed from different

angle will not created 3D effect. However the image elements displaying left eye perspective and right eye perspective respectively, when being directed to different observation locations by the aperture will create 3D illusion by an observer when the left eye perspective image and right eye perspective image are being viewed by the left eye and right eye respective only.

Applicant argued that the image display is not stereoscopic however the specification explicitly states (for instance Figures 3 and 4), that the 3D image display device is stereoscopic. The applicant is respectfully noted it is noted that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The claims at this juncture are still not enabling. If applicant is claiming a holographic 3D image display device, such should be explicitly stated and the relevant features for making such display device should be explicitly stated in the claims.

Also the specification fails to teach how could a "solid state three-dimensional *device*" can be manufactured by having substrate and dynamic parallax barrier. A solid-state three-dimensional *device* is DIFFERENT from a solid-state three-dimensional *display* device.

The specification also fails to teach how could the frame rate of the display device is capable of producing "at least 8 viewing angles" as recited in claim 12, (originally was in claim 11). A frame rate of the display device, **only controls** rate of image frame being displayed but it does not control the *what* and *where* the images are being displayed. Also the viewing angles are related to the aperture location and the image location, not on frame rate.

The specification and the claims also fail to teach how could the horizontal parallax having a "viewable operating range up to 180 degrees" and vertical parallax having a "viewable operating range up to 180 degrees" as recited in the various claims. The parallax of angular viewing the images for achieving stereoscopic image display cannot exceed the angle viewing difference between two eyes of the observer which is a very narrow angle. It is not clear the parallax needed for achieving stereoscopic is

capable being viewed at 180 degrees. Such angle range certainly will not be able to achieve stereoscopic image display and viewing.

Claim 76 recites the phrase "a hybrid screen" but the specification fails how a hybrid screen is formed.

The claims are full of errors that make the device a non-enabling device.

Claim Objections

9. **Claims 1-52 and 57-81 are objected to because of the following informalities:**

The claims at this juncture are full of errors, confusions and indefiniteness. The examiner can only point out a few. It is applicant's responsibility to clarify **ALL** of the discrepancies of the claims to make the claims in complied with the requirements of 35 USC 112, first and second paragraphs.

(1). **Claims 1, 21, 27, 29, 42, and 57** include the phrase "different perspectives of a displayed 3D image viewable from respective multiple different user viewing angles" that is confusing and indefinite. It is not clear how could a 3D image is possible be displayed on a 2D image device. If the image is displayed on a 2D display screen, how could it have different perspectives that are viewable from respective multiple different user viewing angles? The claims still fail to teach where do these "multiple different user viewing angles" come from? These angles have to be defined by the structures of the device however no such teachings are disclosed.

(2). The phrase "control system controlling *sequencing* of said display screen and said aperture plate to produce three-dimensional images" as recited in claim 2 is confusing and wrong. **Firstly**, there is no "sequencing" of the display screen that can be controlled. **Secondly**, what exactly is the "*sequencing*" is being controlled here? **Thirdly**, control "sequencing" **WILL NOT** provide three-dimensional images. The image frame for certain perspectives and locations intended for viewing can be sequentially displayed

on the screen and location of the apertures on the aperture plate can be controlled in synchronization with the image frame displayed to achieved three dimensional viewing.

(3). The aperture plate may have apertures on the plates but will not "produce" slit apertures. The amended term "capable of" recited in claim 5 is confusing and indefinite since it is not clear if the phrase after the term is or is not part of the claim.

(4). **Claim 9 is wrong**. If the aperture plate has number of apertures that *equals* the number of the number of the pixels then the aperture plate essentially has no function, since all of the image light from all of the pixels will just pass through the aperture plate and no three-dimensional display will be achieved.

(5). The phrase "a solid state scan type" and "a solid state type" recited in various claims are confusing since it is not clear what are these **types**. The applicant is respectfully noted the word "type" is like the word "like" that is indefinite.

(6). The phrase "a number of vertical viewing angles is less than a number viewing angles" recited in claim 41 is completely confusing.

(7). The phrase "a solid state three dimensional display device" recited in various claims is confusing since it is not clear what is this "solid state" referred to. It is untreatable all of the elements in the claims are of "solid state" not "liquid state". Is this what the phrase meant?

(8). The phrase "a hybrid screen" recited in claim 76 and its dependent claims is confusing and indefinite since it is not clear what does it means by the term "hybrid"?

(9). The phrase "capable of" recited in various claims is confusing and indefinite. It has been held the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138.

The claims are full of errors and for at least the reasons stated above, the scopes of the claims are not clearly defined. Appropriate correction is required.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Harrold et al (PN. 5,969,850).

The claims fail to define an enabling device and the scopes are not definite, they can therefore only be examined in the broadest interpretation.

Harrold et al teaches a *three dimensional image display device* that is comprised of a *display device* having a screen (Fast SLM, 1 Figures 31 and 34), wherein the display device is a liquid *crystal display device* having pixels and pixel width and a *dynamic parallax barrier* (LCD2) serves as the *aperture plate* disposed in front of the display device for allowing different pairs of spatially multiplexed 2D images displayed on the display device are viewed at *different fields* or different *viewing angles*, (please see Figures 31 and 34) such that multiple stereoscopic or three dimensional images can be viewed at different viewing fields, (please see column 12-13).

Claim 1 recites the phrase "display providing different perspectives of a displayed 3D image viewable from respective multiple different user viewing angles". The phrase "a displayed 3D image viewable from respective ... user viewing angles" is rejected for the reasons stated above. This phrase is examined in the broadest interpretation. The image displayed on the fast spatial light

modulator (SLM, Figures 34) of Harold et al is considered to be an image that can be viewed as 3D image by the arrangement of the dynamic parallax barrier and the image displayed provides 3D image viewable from respective multiple different user viewing angles as shown in Figure 34 of different fields or different viewing windows (72-75).

Harrold et al teaches that *a gap* such a *solid substrate* is interposed between the display device (1) and the dynamical parallax barrier (2). This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the gap separates the display screen and the parallax barrier or the aperture plate is in the range of 0.1 cm to 5 cm. However this value is either inherently met by the disclosure since this value is essential for achieving the three-dimensional image viewing with respect to the size of the display and aperture plate or it is an obvious modification to one skilled in the art for making the display device suitable for use in system having elements with specific size in the range. It has been held that a mere change in size of a device is generally recognized as being within the general skill in the art. In re Rose, 105, USPQ 237 (CCPA 1955).

Harrold et al teaches that the displaying of the pairs of spatially multiplexed 2D images in different viewing field are synchronize with the dynamical parallax barrier to ensure the images are viewed at different angle of view.

With regard to claim 3, although this reference does not teach that the gap is an air gap, such modification is considered to be obvious to one skilled in the art for reducing the material needed for manufacturing the device.

With regard to features concerning the slit apertures of the aperture plate, Harrold et al teaches that the dynamical parallax barrier has *vertical* slits apertures, (please see Figures 2 and 3). The slit width is compatible with the width of the pixel of the display device, since the width of the slits is essential for making the device capable of displaying three-dimensional images. The number of the apertures on the

dynamical parallax barrier can be smaller than or the same as the number of the pixels of the display device, (please see Figures 31 and 34).

With regard to the features concerning the display device and the dynamical parallax barrier, **Harrold** et al teaches that both the display device and dynamical parallax barrier can be made of *liquid crystal display device* or *ferroelectric liquid crystal display devices*, (FLC) (please see column 12, lines 26-30). Harrold et al teaches that the display device comprises a fast modulator such as *fast FLC device*, although this reference does not teach explicitly about the frame rate of the image displayed on the display device it is known in the art that a FLC device has a typical rate of 10Khz or 10, 000 frames per second. The number of the viewing angles is considered to be obvious modification to one skilled in the art to make the display device suitable for different applications requirements. The display device shown in Figures 31 and 34 is of rear projection type of display device.

With regard to claims 17 and 18, the dynamical parallax barrier comprises the ferroelectric liquid crystal display device serves as the solid state scan type.

12. Claims 21-52 and 57-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Aritake et al in (PN. 6,061, 083) view of the patents issued to Harrold et al (PN. 5,969,850) and Isono et al (PN. 5,315,377).

The claims fail to define an enabling device and the scopes are not definite, they can therefore only be examined in the broadest interpretation.

Aritake et al teaches a *stereoscopic image display device* that is comprised of a *display device* (302 or 602, Figures 32-35, 43, 58 and 62) and a *parallel scanning part* (303) serves the *aperture plate* having a plurality of apertures, (please see Figure 43B), that is disposed in front of the display device. Aritake teaches that the parallel scanning part may include *liquid crystal shutter* (341) having the *slit*

apertures arranged in *matrix format* to allow images provide both *vertical and horizontal parallax*, (please see Figures 43B, column 22 line 67 to column 23, line 9).

It is implicitly true that *a distance separation* between the display device and the aperture plate is provided. This reference has met all the limitations of the claims with the exception that it does not teach *explicitly* that the display device having pixels and a pixel width. However such feature is implicitly included since **Aritake** et al teaches that the image data displayed on the display device can be pixilated to represent different perspective of the object, (please see Figure 6) and the pixilated image is required to cooperate with the scanning part to provide different view of the stereoscopic image at multiple viewing angles. Furthermore, display device having pixels for displaying image in the pixilated format is very well known in the art. **Harrold** et al in the same field of endeavor teaches to use a fast spatial light modulator such as a *ferroelectric liquid crystal display device* for displaying multiple view of stereoscopic image, (please see Figures 31-34). It would then have been obvious to one skilled in the art to apply the teachings of **Harrold** et al to use a ferroelectric liquid crystal display device as the *fast* display device required by *Aritake* et al to efficiently display the image data for creating multiple stereoscopic image viewable from different viewing angles. Harrold et al teaches that the aperture size is not smaller than the pixel size. With regard to claims 76-77, the display device of Harrold et al shown in Figures 31 and 34 is of rear projection type of display device and it includes a display screen.

Claims 21, 42, and 57 include the phrase "display providing different perspectives of a displayed 3D image viewable from respective multiple different user viewing angles". The phrase "a displayed 3D image viewable from respective ... user viewing angles" is rejected for the reasons stated above. This phrase is examined in the broadest interpretation. The image displayed on the high speed display device (302) comprises multi-viewpoint image signals that are viewable from respective multiple different user viewing angles, representing by the N viewpoints, (Figures 28-35, Aritake et al). Aritake et al also explicitly teaches that the multi-viewpoint image signals are formed by

capturing different perspective images of a 3D object from different user viewing angles, (please see Figures 5 and 6).

Claims 21, 42, 57, and 68 have been amended to include the phrase that a displayed 3D image which are simultaneously viewable from respective multiple different user viewing angle with respect to an opening or an aperture. Harrold et al teaches such explicitly as shown in Figure 36, the left eye and right eye perspective images displayed on the SLM (two pixel elements) located near a **single** aperture or opening in the dynamic parallax barrier directs the left eye perspective image and right eye perspective image to two *different* observation locations (corresponding to eye positions) for observer 2, wherein the left eye and right eye perspective images are viewed by observer 2 *simultaneously* at two different user viewing angle, to create the 3D image viewing illusion. Isono et al in the same field of endeavor also demonstrated explicitly by arranging the pixels size with the aperture size of the parallax barrier, multiple perspective images (2A to 2F, Figure 4) can be directed by a single aperture on the parallax barrier (28) to multiple viewing positions such that each of the perspective views can be viewed at a different user viewing angle. It would then have been obvious to one skilled in the art to apply the teachings of **Harrold** et al and **Isono** et al to modify size of the aperture and the size of the image pixels to allow multiple perspective images be directed by a single aperture at different user viewing angle to for the benefit of providing multiple 3D views to multiple users.

With regard to claims 23-25, 42-43, 57-58 and 76, Aritake et al teaches that air gap may be included in the separation between the display device and the aperture plate or the scanning part but it does not teach explicitly that the separation may also be formed of a solid substrate. **Harrold** et al teaches that a *solid substrate* may be used to interpose between the display device (1) and the dynamical parallax barrier (2, Figure 34) to keep the two in proper structural relationship. It would then have been obvious to one skilled in the art to apply the teachings of **Harrold** et al to make a solid substrate as the separation for properly separating the two and to ensure the proper distance be set between the two to

ensure good image quality. These references however do not teach explicitly that the gap separates the display screen and the parallax barrier or the aperture plate is in the range of 0.1 cm to 5 cm or to 10 cm. However this value is either inherently met by the disclosure since this value is essential for achieving the three-dimensional image viewing with respect to the size of the display and aperture plate or it is an obvious modification to one skilled in the art for making the display device suitable for use in system having elements with specific size compatible in the range. It has been held that a mere change in size of a device is generally recognized as being within the general skill in the art. In re Rose, 105, USPQ 237 (CCPA 1955).

With regard to the features concerning *horizontal view angle*, the *vertical view angle*, the *horizontal parallax viewable range* and *vertical parallax viewable range*, it is implicitly true that the view angles for the horizontal is within the angle ranges claimed, (please see the Figures shown in Aritake et al and Harrold et al) and the view angle for the vertical is also within the range claimed since Aritake et al specifically teaches to include a vertical visible range expansion element included (please see Figure 24) in the scanning part or the aperture plate. The features concerning the horizontal and vertical parallax viewable ranges are not clearly defined and they cannot be examined with details. However it is implicitly true that a "parallax" certainly can be viewed in the ranges claimed.

With regard to claims 31-38, 45-48, 53, 57, 59-63, and 69-71, **Aritake** et al teaches that the aperture plate or the scanning part may include liquid crystal shutter (Figure 43B). **Harrold** et al teaches that both the display device and the aperture plate or the dynamical parallax barrier may be made of liquid crystal device or fast switching type ferroelectric liquid crystal display device, (please see column 12, lines 25-30). Although these references do not teach explicitly about the frame rate of the image displayed on the display device it is known in the art that a FLC device has a typical rate of 10Khz or 10, 000 frames per second. The display device shown taught by Aritake et al and Harrold et al as in Figures 31 and 34 of is of rear projection type of display device.

13. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isono et al (PN. 5,315,377).

Isono et al teaches a *three dimensional display device* that is comprised of a liquid crystal panel serves as the *display screen* (46, Figures 1-4) and a liquid crystal barrier display panel displaying dynamically controlled apertures, serves as the aperture *plate* (28) disposed in *front* of the display screen with a *gap separation* wherein a multiple different perspectives of images (2A to 2F) are displayed on the display screen and are projected via the aperture plate though a single aperture or opening to a *multiple different viewing positions* (O1 to O6) wherein each of the different perspective is viewed at a different user viewing angle.

Isono et al teaches that *a gap* such an air gap is interposed between the display device (46) and the parallax barrier display panel (28). This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the gap separates the display screen and the parallax barrier or the aperture plate is in the range of 0.1 cm to 5 cm. However this value is either inherently met by the disclosure since this value is essential for achieving the three-dimensional image viewing with respect to the size of the display and aperture plate or it is an obvious modification to one skilled in the art for making the display device suitable for use in system having elements with specific size in the range. It has been held that a mere change in size of a device is generally recognized as being within the general skill in the art. In re Rose, 105, USPQ 237 (CCPA 1955).

Claim 1 recites the phrase "display providing different perspectives of a displayed 3D image viewable from respective multiple different user viewing angles". The phrase "a displayed 3D image viewable from respective ... user viewing angles" is rejected for the reasons stated above. This phrase is examined in the broadest interpretation. The image displayed on the liquid crystal panel (46) of Isono et al is considered to be images that can be viewed as 3D image by the arrangement of

the dynamic parallax barrier and the image displayed provides 3D image viewable from respective multiple different user viewing angles as shown in Figure 4 of different viewing windows or positions (O1 to O6).

With regard to claim 4, Isono et al teaches that solid glass spacer (212, Figure 13) may also be used to separate the display device (46) and barrier display panel (28).

With regard to features concerning the slit apertures of the aperture plate, Isono et al teaches that the dynamical parallax barrier has *vertical* slits apertures, (please see Figures 6). The slit width is compatible with the width of the pixel of the display device, since the width of the slits is essential for making the device capable of displaying three dimensional images. The number of the apertures on the dynamical parallax barrier can be smaller than or the same as the number of the pixels of the display device, (please see Figures 4 and 6).

With regard to the features concerning the display device and the dynamical parallax barrier, **Isono** et al teaches that both the display device and dynamical parallax barrier can be made of *liquid crystal display device,* (please see column 4, lines 10-12). Although this reference does not teach explicitly about the frame rate of the image displayed on the display device, however such modification is considered to be obvious to one skilled in the art to allow fast switching rate for displaying the image as desired. The number of the viewing angles is considered to be obvious modification to one skilled in the art to make the display device suitable for different applications requirements.

With regard to claims 17 and 18, the dynamical parallax barrier comprises the liquid crystal display device which could serve as the solid state scan type.

14. Claims 21-52 and 57-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Isono et al (PN. 5,315,377) in view of the patent issued to Aritake et al in (PN. 6,061, 083).

The claims fail to define an enabling device and the scopes are not definite, they can therefore only be examined in the broadest interpretation.

Isono et al teaches a *three dimensional display device* that is comprised of a liquid crystal panel serves as the *display screen* (46, Figures 1-4) and a liquid crystal barrier display panel displaying dynamically controlled apertures, serves as the *aperture plate* (28) disposed in *front* of the display screen with a *gap separation* wherein a multiple different perspectives of images (2A to 2F) are displayed on the display screen and are projected via the aperture plate though a **single** aperture or opening to a *multiple different viewing positions* (O1 to O6) wherein each of the different perspective is viewed at a different user viewing angle and they can be simultaneously viewed by different users.

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the three dimensional image display displays image exhibiting both horizontal and vertical parallax. Aritake et al in the same field of endeavor teaches a *stereoscopic image display device* that is comprised of a *display device* (302 or 602, Figures 32-35, 43, 58 and 62) and a *parallel scanning part* (303) serves as the *aperture plate* having a plurality of apertures, (please see Figure 43B), that is disposed in front of the display device. Aritake teaches that the parallel scanning part may include *liquid crystal shutter* (341) having the *slit apertures* arranged in *matrix format* to allow images provide both *vertical and horizontal parallax*, (please see Figures 43B, column 22 line 67 to column 23, line 9). It would then have been obvious to one skilled in the art to modify the image display device of Isono et al to allow the three dimensional display device to provide both vertical and horizontal parallax to provide a full three dimensional image viewing effect.

Claims 21, 42 and 57 recite the phrase "display providing different perspectives of a displayed 3D image viewable from respective multiple different user viewing angles". The phrase "a displayed 3D image viewable from respective ... user viewing angles" is rejected for the reasons stated above. This phrase is examined in the broadest interpretation. The image displayed on the

liquid crystal panel (46) of Isono et al is considered to be images that can be viewed as 3D image by the arrangement of the dynamic parallax barrier and the image displayed provides 3D image viewable from respective multiple different user viewing angles as shown in Figure 4 of different viewing windows or positions (O1 to O6).

With regard to claims 23-25, 42-43, 57-58 and 76, Isono et al teaches that air gap (Figure 4) or a solid glass spacer (212 Figure 13) may be included in the separation between the display device (46, Figure 4) and the aperture plate or parallax barrier display panel (28). These references however do not teach explicitly that the gap separates the display screen and the parallax barrier or the aperture plate is in the range of 0.1 cm to 5 cm or to 10 cm. However this value is either inherently met by the disclosure since this value is essential for achieving the three-dimensional image viewing with respect to the size of the display and aperture plate or it is an obvious modification to one skilled in the art for making the display device suitable for use in system having elements with specific size compatible in the range. It has been held that a mere change in size of a device is generally recognized as being within the general skill in the art. In re Rose, 105, USPQ 237 (CCPA 1955).

With regard to the features concerning *horizontal view angle*, the *vertical view angle*, the *horizontal parallax viewable range* and *vertical parallax viewable range*, it is implicitly true that the view angles for the horizontal is within the angle ranges claimed, (please see the Figures shown in Isono et al and Aritake et al) and the view angle for the vertical is also within the range claimed since Aritake et al specifically teaches to include a vertical visible range expansion element included (please see Figure 24) in the scanning part or the aperture plate. The features concerning the horizontal and vertical parallax viewable ranges are not clearly defined and they cannot be examined with details. However it is implicitly true that a "parallax" certainly can be viewed in the ranges claimed.

With regard to claims 31-38, 45-48, 53, 57, 59-63, and 69-71, **Isono** et al teaches that both the image display panel and the aperture plate or the barrier display panel include liquid crystal display

device, (please see column 4, lines 10-12). Although this reference does not teach explicitly about the frame rate of the image displayed on the display device, however such modification is considered to be obvious to one skilled in the art to allow fast switching rate for displaying the image as desired. The number of the viewing angles is considered to be obvious modification to one skilled in the art to make the display device suitable for different applications requirements.

Response to Arguments

15. Applicant's arguments filed on September 22, 2006 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and they are rejected for the reasons stated above.

16. Applicant's arguments concerning the rejections of the claims under 35 USC 112, first paragraph, have been fully addressed in the paragraphs above. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the 3D image display is holographic in nature or is not stereographic 3D image display) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

17. Applicant's arguments concerning the amended features in the claims have been fully considered and addressed in the paragraphs above.

In response to applicant's arguments concerning cited Harrold et al reference which states that the 3D display device of Harrold et al only provides one viewing angle at time, the examiner respectfully disagrees. Harrold et al teaches explicitly as shown in Figure 36, the left eye and right eye perspective images displayed on the SLM (two pixel elements) located near a **single** aperture or opening in the dynamic parallax barrier are directed by the aperture to two *different* observation locations (corresponding

to eye positions) for observer 2, wherein the left eye and right eye perspective images are viewed by observer 2 *simultaneously* at two *different* user viewing angle, to create the 3D image viewing illusion. A single 3D image is created form a left perspective image and a right perspective image and these two images are being viewed from two different user viewing angle. Harrold et al reference therefore reads on the instant application.

In response to applicant's arguments concerning the cited Aritake et al reference concerning the using of lenticular lens are not persuasive to overcome the rejection since suing or not using the lenticular lens is not even part of the claims. Also one skilled in the art would understand each lenslet of the lenticular lens actually defines an effective aperture or opening.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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